

Applicant: McCormick
Serial No.: 10/713,334
Group Art No: 3752

PATENT
Atty Docket: 1506-310

REMARKS

This Amendment is filed in response to the Official Action mailed November 15, 2005. In this Amendment, claims 1, 8, 13, 16 and 20 are amended and claims 1-5, 8-11 and 17-19 are unchanged. Following entry of this amendment claims 1-5, 8-11, 13 and 16-20 shall be pending.

In the Office Action, claim 20 has been objected to, claims 1-5, 8-11, 13, and 16-20 have been rejected based on prior art grounds and claims 6, 7, 12, 14, and 15 remain withdrawn from consideration. For the reasons set forth below, these rejections are hereby traversed.

I. CLAIM OBJECTION

The Examiner objected to claim 20 because of a typographical error. Claim 20 has been amended to correct this error by including the word "side" instead of "said".

II. REJECTIONS UNDER 35 U.S.C. SECTION 112

Claim 13 is rejected under 35 U.S.C. Section 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, the Examiner indicates that he is unsure exactly what is arranged at "various angles".

Claim 13 has been amended to better clarify the language of the claim. Claim 13, as amended now reads "the irrigation sprinkler of claim 8 wherein said stepped radial offsets are arranged at an angle relative to the nozzle to increase a boundary layer of fluid within said nozzle."

III. REJECTIONS UNDER 35 U.S.C. SECTION 102

Claims 1-5, 8-11, 13 and 16-20 are rejected under 35 U.S.C. Section 102(e) as being anticipated by U.S. Publication No. 2003/0218082 to *Malcolm (The Malcolm Publication)*. For at least the reasons set forth below, this rejection is hereby traversed.

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Turning first to claim 1, this claim is directed to an irrigation sprinkler for uniformly watering a target area comprising: a sprinkler body; a nozzle disposed on said sprinkler body; said nozzle comprising a substantially hollow, cylindrically shaped body having a first end, a second end and a flow passageway extending therebetween surrounded by an internal wall; and a plurality of stepped, radial offsets formed along said internal wall such that an internal diameter of said nozzle progressively decreases from said first end to said second end of said nozzle.

The Malcolm Publication cannot be properly relied upon as anticipating the invention as recited in claim 1. For example, the Examiner asserts that Figure 2 and paragraphs [0014] and [0015] of *The Malcolm Publication* show a plurality of stepped, radial offsets formed along said internal wall such that an internal diameter of said nozzle decreases from said first end to said second end of said nozzle. However, a close examination of Figure 2 reveals two circular rings 36a which are raised above the interior surface 32 of the nozzle. While the internal diameter of the nozzle may have a decreased size at each ring 36a, the internal diameter is the same on either side of the ring 36a. In other words, the internal diameter of the nozzle of *The Malcolm Publication* alternates between increasing and decreasing diameters. Therefore, these rings 36a simply result in a ribbed configuration where the internal diameter of the nozzle is the same on the first end of the nozzle as on the second end. By contrast, claim 1 includes a plurality of stepped, radial offsets formed along said internal wall such that an internal diameter of said nozzle progressively decreases from said first end to said second end of said nozzle.

Additionally, the Examiner asserts "that 'orifice plate 20' would also read on one of the radial offsets as claimed." While the orifice plate 20 of *The Malcolm Publication* may have a diameter smaller than the internal diameter of the nozzle, as seen best in Figure 2, the internal nozzle diameter actually is increased on the downstream side of the orifice plate 20 as compared to the internal diameter of the nozzle at the upstream side of the orifice plate 20. Thus, the orifice plate 20 forms a shape that results in an

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increase not a decrease in the diameter of the nozzle between the first and second end of the nozzle. In this respect, using one or even a plurality of orifice plates 20 with or without rings 36a would fail to achieve the invention as claimed in claim 1.

It should be further noted that the design of *The Malcolm Publication* and the present invention as claimed in claim 1 affect the boundary layer for different purposes. As seen in paragraph [0005], the design of *The Malcolm Publication* creates turbulence, "more effectively stripping water from the outer core of the stream as it flows through the slots of the orifice plate." In contrast and as seen in paragraph [0034] of a preferred embodiment of the present application, the present invention increases the boundary layer. And because the rate of boundary layer fluid flow is less than centerline fluid flow, the resulting spray pattern produced by the present invention produces even water distribution over the entire throw radius of the nozzle. In other words, it appears that *The Malcolm Publication* seeks to strip the boundary layer from the water stream altogether whereas the present invention seeks to modify the boundary layer so as to ensure even water distribution.

Thus, for at least these reasons *The Malcolm Publication* fails to anticipate claim 1. It is also submitted that *The Malcolm Publication* does not render the invention obvious.

Claims 2-5 depend from claim 1 and thus for at least the above reasons are also novel and unobvious over the cited prior art. However, these claims further limit the claimed invention and thus are separately patentable over the cited prior art.

The presently claimed invention as set forth in claim 8 is directed to an irrigation sprinkler for uniformly watering a target area comprising a sprinkler body; a nozzle disposed on said sprinkler body; said nozzle comprising a substantially hollow, cylindrically shaped body having a first end, a second end and a flow passageway extending therebetween surrounded by an internal wall; a plurality of stepped, radial

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offsets formed along said internal wall such that an internal diameter of said nozzle incrementally decreases from said first end to said second end of said nozzle; and at least one fin formed along said internal wall to reduce fluid turbulence.

The Malcolm Publication cannot be properly relied upon as anticipating the invention as recited in claim 8. For example, the Examiner asserts that Figure 2 and paragraphs [0014] and [0015] of *The Malcolm Publication* show a plurality of stepped, radial offsets formed along said internal wall such that an internal diameter of said nozzle decreases from said first end to said second end of said nozzle. However, as previously discussed with regards to claim 1, Figure 2 reveals two circular rings 36a which are raised above the interior surface 32 of the nozzle. While the internal diameter of the nozzle may have a decreased size at each ring 36a, the internal diameter is the same on either side of the ring 36a. In other words, the internal diameter of the nozzle of *The Malcolm Publication* alternates between increasing and decreasing diameters. Therefore, these rings 36a simply result in a ribbed configuration wherein the internal diameter of the nozzle is the same on the first end of the nozzle as on the second end. By contrast, claim 8 includes a plurality of stepped, radial offsets formed along said internal wall such that an internal diameter of said nozzle incrementally decreases from said first end to said second end of said nozzle.

Additionally, the Examiner asserts "that 'orifice plate 20' would also read on one of the radial offsets as claimed." While the orifice plate 20 of *The Malcolm Publication* may have a diameter smaller than the internal diameter of the nozzle, as seen best in Figure 2, the internal nozzle diameter actually is increased on the downstream side of the orifice plate 20 as compared to the internal diameter of the nozzle at the upstream side of the orifice plate. Thus, the orifice plate 20 forms a shape that results in an increase not a decrease in the diameter of the nozzle between the first and second end of the nozzle. In this respect, using one or even a plurality of orifice plates 20 with or without rings 36a would fail to achieve the invention as claimed in claim 8.

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It should be further noted that the design of *The Malcolm Publication* and the present invention as claimed in claim 8 affects the boundary layer for different purposes. As seen in paragraph [0005], the design of *The Malcolm Publication* creates turbulence, "more effectively stripping water from the outer core of the stream as it flows through the slots of the orifice plate." In contrast, and as seen in paragraph [0034] of a preferred embodiment of the present invention, the present invention increases the boundary layer. And because the rate of boundary layer fluid flow is less than centerline fluid flow, the resulting spray pattern produced by the present invention produces even water distribution over the entire throw radius of the nozzle. In other words, it appears that *The Malcolm Publication* seeks to strip the boundary layer from the water stream altogether where the present invention seeks to modify the boundary layer so as to ensure even water distribution.

Thus, for at least these reasons *The Malcolm Publication* fails to anticipate claim 8. It is also submitted that *The Malcolm Publication* does not render the invention obvious.

Claims 9-11 and 13 depend from claim 8 and thus for at least the above reasons are also novel and unobvious over the cited prior art. However, these claims further limit the claimed invention and thus are separately patentable over the cited prior art.

Claim 16, as currently amended, is directed to a method of uniformly watering a target area comprising providing a sprinkler attached to a fluid source; introducing fluid from said fluid source to said sprinkler; urging said fluid to an exit of said sprinkler; and increasing a boundary layer thickness of said fluid as it exits said sprinkler by urging said fluid through a plurality of stepped offsets along an internal surface forming a decreasing diameter along said exit.

The Malcolm Publication cannot be properly relied upon as anticipating the invention as recited in claim 16. For example, the Examiner asserts that Figure 2 and paragraphs [0014] and [0015] of *The Malcolm Publication* disclose increasing a boundary layer thickness of said fluid as it exits said sprinkler by urging said fluid

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through a plurality of stepped offsets along an internal surface forming a decreasing diameter along said exit. However, as previously discussed with regards to claim 1 and 8, Figure 2 reveals two circular rings 36a which are raised above the interior surface 32 of the nozzle. While the internal diameter of the nozzle may have a decreased size at each ring 36a, the internal diameter is the same on either side of the ring 36a. In other words, the internal diameter of the nozzle of *The Malcolm Publication* alternates between increasing and decreasing diameters. Therefore, these rings 36a simply result in a ribbed configuration wherein the internal diameter of the nozzle is the same on the first end of the nozzle as on the second end. By contrast, claim 16 includes urging said fluid through a plurality of stepped offsets along an internal surface forming a decreasing diameter along said exit.

Additionally, the Examiner asserts "that 'orifice plate 20' would also read on one of the radial offsets as claimed." While the orifice plate 20 of *The Malcolm Publication* may have a diameter smaller than the internal diameter of the nozzle, as seen best in Figure 2, the internal nozzle diameter actually is increased on the downstream side of the orifice plate 20 as compared to the internal diameter of the nozzle at the upstream side of the orifice plate 20. Thus, the orifice plate 20 forms a shape that results in an increase not a decrease in the diameter of the nozzle between the first and second end of the nozzle. In this respect, using one or even a plurality of orifice plates 20 with or without rings 36a would fail to achieve the invention as claimed in claim 16.

It should be further noted that the design of *The Malcolm Publication* and the present invention as claimed in claim 16 affects the boundary layer for different purposes. As seen in paragraph [0005], the design of *The Malcolm Publication* creates turbulence, "more effectively stripping water from the outer core of the stream as it flows through the slots of the orifice plate." In contrast and as seen in paragraph [0034] of a preferred embodiment of the present invention, the present invention increases the boundary layer. And because the rate of boundary layer fluid flow is less than centerline fluid flow, the resulting spray pattern produced by the present invention produces even water distribution over the entire throw radius of the nozzle. In other

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words, it appears that *The Malcolm Publication* seeks to strip the boundary layer from the water stream altogether where the present invention seeks to modify the boundary layer so as to ensure even water distribution.

Thus, for at least these reasons *The Malcolm Publication* fails to anticipate claim 16. It is also submitted that *The Malcolm Publication* does not render the invention obvious.

Claims 17-20 depend from claim 16 and thus for at least the above reasons are also novel and unobvious over the cited prior art. However, these claims further limit the claimed invention and thus are separately patentable over the cited prior art.

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CONCLUSION


In view of the foregoing, it is submitted that pending claims 1-5, 8-11, 13, and 16-20 are now in condition for allowance. Hence an indication of allowability is hereby requested.

If for any reason direct communication with Applicants' attorney would serve to advance prosecution of this case to finality, the Examiner is cordially urged to call the undersigned attorney at the below listed telephone number.

The Commissioner is authorized to charge any fee which may be required in connection with this Amendment to deposit account No. 50-2809.

Respectfully submitted,

Dated: 3/15/06



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